seismic disturbance. While the above-mentioned phenomena were occurring in Ischia, without their being communicated to Rome, or even, for want of means, properly noted on the spot, the existence of unusual subterranean activity was simultaneously marked by the instruments in all the observatories on the mainland. That activity, though varying in intensity in different places, manifested a general and regularly progressive augmentation. Slight shocks of earthquake were felt at various points. On July 25 the Solfatara of Albano, on the extinct Latin volcanoes on the southern side of the Roman Campagna, sent forth sounds never before remarked. On the same day a widely extended earthquake, reaching from Cosenza to Catanzaro, occurred in Calabria. On Friday, the 27th, the hissing noises from the Solfatara of Albano were so acute that the people did not dare to draw the sulphur water for those who needed it, and simultaneously the seismic instruments at Pesaro registered severe oscillations. At Vesuvius on the evening of Friday, the 27th, shocks were felt, with an augmentation of activity. There were shocks at Latera, upon the Ciminian volcanoes, and shocks at Perugia. On the afternoon of the 28th renewed activity was manifested at Pesaro and at Fermo; and in short the observations during that afternoon of general calm throughout the peninsula gave indications of a vast subterranean disturbance, extending as far as all Umbria, the district of Viterbo, and the Marches.

"The direction of these extended movements was everywhere identical with those at Casamicciola—namely, from north to south, and from east to west. At the same time also, on the morning of the 28th, the flow from the principal source of the sulphur streams, near Tivoli, showed a considerable diminution; while simultaneously an increased quantity of carbonic acid gas was given forth. The regular observations at Bologna, at Pisanello, near Piacenza, and at Rome, showed that there was a distinct lowering in the levels of the wells before July 28, and as marked a rise after that date. These facts confer increased credibility on the imperfect evidence of there having been a deficiency of water in the wells at Casamicciola. Moreover, on the morning of Sunday, the 29th, the usually very cold waters of the Solfatara of Albano were in a boiling state. The intimate connection between these phenomena on the peninsula and the catastrophe in Ischia is more than evident, and their distinct dynamic and volcanic character absolutely excludes the idea of a mere local sinking in the level."

NOTES

TELEGRAMS from Drontheim to Vienna announce that the members of the Austrian expedition to Jan Mayen have arrived there safe and well, after an absence of six months. This was one of the circumpolar observing parties, and during the year's residence on Jan Mayen neither officers nor men suffered from scurvy or other disease. The chief of the expedition telegraphs to the Geographical Society of Vienna that they have made "perfect observations, rich collections, and taken geodetic and photographic views of the island."

DURING the coming year, we learn from *Science*, experiments will be made at the physical laboratory of Johns Hopkins University with a view to aid in establishing an international unit of electrical resistance. The experiments will be carried on under the direction of Prof. Rowland, with an appropriation from the Government of the United States. The results will be communicated to the International Commission of Electricians meeting in Paris.

DR. ROBERT MOFFAT, the famous African missionary, has died at the advanced age of eighty-seven years. He was among the first to show the way to Central South Africa, and added not a little to our knowledge of the Bechuanas and other tribes south of the Zambesi. He was Livingstone's father-in-law, and the special direction of the great missionary-traveller's African work was to a considerable extent due to Moffat's example and advice.

THE Ninth Annual Conference of the Cryptogamic Society of Scotland will be held at Dumfries on September 11, 12, and 13. Fellows who purpose attending the Conference are requested to communicate with the local Secretary, Mr. J. Rutherford, Jardington, Dumfries.

THE statue of the brothers Montgolfier was unveiled at Annonay on Monday, as part of the ceremonies commemorative of the centenary of the inventors of balloons. M. de Fonvielle writes to us from Annonay, August 12: "This celebration has been organised merely by private exertions in continuation of the banquet given by the Académie d'Aërostation of Paris on November, 1882, to commemorate the centenary of the first private experiment tried by Joseph Montgolfier at Avignon in his rooms. A local committee was formed in Annonay under the presidency of M. Séguin, the eldest son of Marc Séguin, Member of the Institute, a nephew of the Montgolfier to whom is attributed the creation in France of tubular boilers and metallic bridges. M. Henry Vidon of Annonay was appointed general secretary. The exertions of the Committee were very successful, and about 4000*l.* were collected, principally in the immediate vicinity of Annonay and at Paris; foreign subscriptions were very few. It was decided to erect on the Place des Cordeliers, where the first experiment took place on June 5, 1783, a statue representing the two brothers inventing the 'Montgolfière.' The plaster cast has been executed, and will be inaugurated to-morrow before a large audience. The ceremony will begin at two o'clock with a speech delivered by M. Séguin, after which a small Montgolfière will be sent up from the exact spot where the first experiment took place. On Saturday an aëronautical ascent was made from the Champs de Mars with a small balloon of 3000 cubic feet, the largest that the gas establishment could fill without inconvenience."

IN the just published parts 4 and 5 of his "Abbildungen von Vogelskelettes," Dr. Meyer, of Dresden, proves that the Notornis from the South Island of New Zealand belongs to a different species from that from the North Island—*Notornis mantelli*—and he names the former *N. hochstetteri*. It is known that Prof. Owen founded on some fragments of the skull and the bones from the North Island in the year 1848 the genus Notornis, and that he called the species, without then knowing a skin, *N. mantelli*, after the discoverer. The two skins, which were figured by John Gould in the years 1850 and 1869, and which now adorn the galleries of the British Museum, came from the South Island, and were identified with the bones from the North Island. The Dresden Museum having acquired the skin and skeleton of a specimen of Notornis hunted in the year 1879 on the South Island—all three specimens were procured from within a range of ninety miles—Dr. Meyer compared his skeleton with Prof. Owen's life-size figures in the *Transactions of the Zoological Society*, and found them to be different, which fact is not to be wondered at, as New Zealand has proved to be very rich in species of flightless birds, and as the Notornis fragments came from another island than the three skins and the skeleton, perhaps Notornis became extinct on the North Island, whereas it still survives in certain parts of the South Island. Dr. Meyer is of opinion that if the bones and the skull had been taken out of the skins preserved in the British Museum, one would have known already in the year 1850, or at least in 1869, that they differed from the *Notornis mantelli* fragments of the North Island. The name of those skins, therefore, must be altered, according to Dr. Meyer to *N. hochstetteri*. Dr. Meyer has figured the skeleton of *N. mantelli* in plates 34–37 of his work.

WE are glad to see that the system of appointing men as professors who only teach, and scarcely that, is now being discussed in the United States. It is to be hoped that it will soon be discussed here. The following letter from a correspondent in Germany to the *New York Nation* of July 26 gives the last contribution to the ventilation of the subject:—"SIR,—The controversy carried on in your journal in regard to professorial salaries has not failed to attract considerable attention in Germany, and especially the comparisons instituted between the financial condition of American and that of German professors. As some wrong ideas seem to prevail in America on the subject of the remuneration of university professors in this country, I should like to call attention to the real state of affairs. In the first place, it must be understood that a man who is elected to fill a chair at some German university is not expected to act merely as a teacher. His abilities as an instructor are, as a rule, regarded as a matter of minor importance, if they are at all taken into consideration on his appointment. But he is required to advance science; and, to enable him to fulfil the expectations entertained of him, the Government feels bound to make him financially independent. A grand laboratory or observatory or clinic is placed at his disposal, enormous sums are voted to defray the expenses of the most costly scientific experiments, and, in order to allow him to devote himself exclusively to the advancement of his science, a large salary insures him against the necessity of undertaking extraneous labour. The salary of an 'ordinary professor' amounts to 15,000, often 20,000 or 25,000 marks ($3500 to $5000) per annum. Besides his regular pay he receives the fees paid him by those who attend his lectures. At large universities, like those of Berlin, Breslau, Munich, and Vienna, these fees may reach extraordinary amounts. At Berlin, Reichert, the Professor of Anatomy, is paid 120 marks ($30) by each student for the lecture on anatomy and the concomitant dissecting exercises, during the winter term alone. There were over 400 students, and the sum thus received by one professor amounts to over 48,000 marks. A professor of law or philosophy generally gets 20 marks from each student for a course of lectures extending over one term, and delivered three or four hours a week. As a professor usually delivers more than one course of lectures a term, and as his lectures, especially at a very large university, may be attended by about 150 or 200 students, the emoluments which he enjoys besides his salary may be considered as affording him quite a respectable income. Added to this, the 'ordinary professor' holds his position during good behaviour. Should he choose to resign in his old age, he has claims to a good pension. Socially the professors rank as high as officers, which signifies the respect in which the devotees of science are held in this military country. Prof. Esmarch of Kiel is allied by marriage to the Imperial family of Germany. This care which the German people takes of its savants, in absolving them from the necessity of engaging in the 'madding strife' for existence, is the main secret of the success of the German university system and German scientific triumphs. When the brain-power of the American nation shall be concentrated under such favourable conditions at a few grand seats of learning, and the drudgery of the pedagogue be exchanged for the fruitful labour of the independent scientist, then the youth of America will no longer be compelled to seek opportunities for intellectual development in Europe alone.—L. N."

ESTES AND LAURIAT, Boston (U.S.), announce, the *Nation* informs us, several important new publications: "Ornithology of the World," a popular treatise by Dr. Elliott Coues, fully illustrated; the same author's "Key to North American Birds," revised to date and entirely rewritten, with the incorporation of a practical manual of field ornithology; "The Natural History of Man," a popular work based on Hellwald's "Naturgeschichte des Menschen," which has been translated by Mr. J. S. Kingsley, and edited by him in conjunction with Messrs. W. H. Dall, F. W. Putnam, and Stephen Salisbury, jun.; "Travels in Mexico," by Fred. A. Ober, well equipped with drawings from the author's photographs and with maps.

ON July 19 a terrible hailstorm is reported to have passed over the Government of Tomsk in Siberia. The hailstones were as big as eggs. Two women struck on the head were killed on the spot, besides a number of animals and birds. A terrible hailstorm is also reported to have raged in Iowa on the night of August 7. The track of the storm was four miles wide, passing through three counties. All vegetation was destroyed in its course. One woman lost her life, and many persons were injured. Twenty-two cattle were killed. The hail fell in some places to a depth of five feet. On the Rock Island, Chicago, and Milwaukee Railroads the trains were blocked; and at Lonah station nine freight cars were blown from the rails.

A SPECIAL correspondent of the *Daily Telegraph*, who has been on a visit to Mr. Stanley, and has journeyed a considerable distance up the Congo, contributes the first of a series of letters to Tuesday's issue of that journal, accompanied by a map and a rough sketch.

IT appears from recent analyses communicated to the Kieff Society of Naturalists, that the *Sorghum saccharatum*, of Minnesota, U.S., which was recently introduced into the Russian provinces of Poltava and Kieff, yielded as much as 14·2 to 16·7 per cent. of its weight of crystalline sugar, thus exceeding the average percentage of sugar, which commonly is from 9 to 9·5 per cent.

AN illustrated "Circular of Information," distributed by the United States Bureau of Education, directs attention to a very general yet very sad deficiency, viz. imperfect hearing. Dr. Sexton in it points out that it causes, among other things, defects in pronunciation through children not knowing the correct sound; and failure and ill temper among teachers who may be unaware of their pupils' defects or their own. He urges that the hearing of all pupils should be examined each session, and no one accepted as teacher who has not passed an aural test. He strongly recommends dental inspection of pupils, as from diseased teeth especially arise deficiencies of hearing, from which follow, first, the appearance of stupidity, and eventually the reality. Among the practical precautions recommended, abstinence from bathing seems a very costly one, but few pamphlets could show so clearly the interaction of physical and mental education.

MR. MATTIEU WILLIAMS points out that on p. 350 of NATURE, the dimensions of Jan Mayen are stated in "geographical miles," but that it is evident the old Norwegian sea mile is the measure used. This is equal to four English geographical miles. The length of the island is, therefore, thirty of *our* geographical miles. Mr. Williams says the "old" sea mile and the long land mile have, since July 1879, been legally superseded by the kilometre.

VOL. III. Part VII. of the *Transactions of the Essex Field Club* contains several long papers of interest, besides a considerable number of shorter ones. Among the former are "The Ancient Fauna of Essex," by Dr. H. Woodward; "The Macro-Lepidoptera of the District around Maldon," by Mr. G. H. Rayner; "Deneholes," by Mr. T. V. Holmes; "Primeval Man in the Valley of the Lea," by Mr. W. G. Smith; "On the Species of the Genus *Primula* in Essex," by Mr. Christie; with Mr. Meldola's presidential address, and a notice and portrait of the late Sir Antonio Brady. The society has also issued in a separate form a collection of papers and memorials on the protection of wild animals and plants, and on the present condition and future management of Epping Forest.

AT the recent examination for the Licence es Sciences Physiques in Paris, an English student, Mr. P. J. Hartog, B.Sc. Vict. Univ., passed first of the sixty-six candidates, though by three years the youngest of any.

DURING the latter part of this and the early part of next month a geographical congress and exhibition will take place in Douai. M. Ferdinand de Lesseps has been elected president. Belgium, Holland, Denmark, and Sweden will be represented.

THE United Steamship Association of Copenhagen has offered a free passage by their vessels to all Danish fishermen desirous of visiting the Fisheries Exhibition.

ON August 2, at about 10 p.m., a brilliant meteor passed from south to north over the town of Linköping in Sweden. When in the north-west it burst, spreading an intense pale blue light, and leaving a light smoke in the air which could be distinguished for several seconds. On July 23, at 10.15 p.m., a magnificent meteor was observed at Södertelje in Sweden. It went in a north-westerly direction, leaving a luminous track on the sky.

AS the representative of Sweden in the International Phytopathological Association, recently formed, Dr. J. Eriksson, botanist at the Academy of Agriculture, has been chosen. He is now engaged in collecting statistics and examples of diseases of plants, which it is the object of the Association to study and eradicate.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus* ♂) from India, presented by the Hon. Mrs. Pigott Carleton; two Maholi Galagos (*Galago maholi*) from South Africa, presented by Dr. Hugh Exton; a Rude Fox (*Canis rudis*) from Demerara, presented by Mr. Clement J. Bateman; a Suricate (*Suricata zenik* ♀) from South Africa, presented by Mr. Chas. H. Wootton; a Collared Peccary (*Dicotylès tajaçu*) from South America, presented by Mr. Fritz Zurcher; three Peregrine Falcons (*Falco peregrinus*), European, presented by Mr. J. Snowdon Henry, F.Z S.; two Javan Adjutants (*Leptoptilus javanicus*) from Java, two Indian Tantalus (*Tantalus leucocephalus*) from India, presented by the Hon. W. H. Ravenscroft; a Sclater's Curassow (*Crax sclateri* ♀) from South America, presented by Mr. John Ardran; a Wood Owl (*Syrnium aluco*), British, presented by Mr. G. Carrick Steet; two Ring-tailed Lemurs (*Lemur catta*) from Madagascar, a Black Bear (*Ursus americanus* ♂) from North America, a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, deposited; three Indian Pythons (*Python molurus*) from India, purchased; two Mule Deer (*Cariacus macrotis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE SATELLITES OF SATURN.—Dr. W. Meyer has published corrected, or what he calls definitive, elements of the satellites *Enceladus*, *Tethys*, *Dione*, *Rhea*, *Titan*, and *Japetus*, chiefly founded upon his observations at the Observatory of Geneva in 1881, the mean motions however being determined from a comparison of the Geneva observations with the elements assigned by Jacob from measures of the satellites made at Madras during the years 1856-58. The mean distances and periods resulting from Dr. Meyer's investigations are as follow:—

	Mean distance in equatorial radii of Saturn.	Period. d.	h.	m.	s.
Enceladus	3·8661	1	8	53	6·92
Tethys	4·8116	1	21	18	25·62
Dione	6·1629	2	17	41	9·29
Rhea	8·6082	4	12	25	11·57
Titan	19·9111	15	22	41	23·16
Japetus	57·9303	79	7	49	24·84

The other elements of the orbit of the outer satellite *Japetus* are subjoined; those of Jacob are added for comparison. Meyer's epoch is 1881 Nov. 0·0 G.M.T.; Jacob's is 1858 Jan. 0·0 G.M.T.

	Meyer.		Jacob.
	° ′ ″		° ′
Mean longitude	200 8 53	...	294 31·1
Longitude of peri-Saturnium ...	353 5 7	...	349 20
,, ascending node ...	142 17 27	...	143 1·3
Inclination to ecliptic	18 26 50	...	18 37·9
Eccentricity	0·028916	...	0·028443
Semi-axis major (for mean distance of Saturn)	514″·711	...	514″·96
Mean diurnal motion	4°·538273	...	4°·538042

TEMPEL'S COMET OF SHORT PERIOD (1873 II.).—Prof. Krueger, in transferring to the *Astronomische Nachrichten* the few positions lately given in this column, mentions that M. Schulhof of Paris, who has undertaken the calculations for the comet, promises an ephemeris in due course for that periodical.

THE BISCHOFFSHEIM OBSERVATORY AT NICE.—M. Perrotin, Director of the Observatory of Montgros, near Nice, lately founded by the munificence and scientific spirit of M. Bischoffsheim of Paris, has made an excellent beginning in the proposed work of that establishment. The Observatory is provided with a refractor of 15 inches aperture, and about 18 feet focal length, the object glass by MM. Henry of the Observatory at Paris, the mounting by Eichens and Gautier. This instrument M. Perrotin applied in June last to measures of a number of the more interesting double-stars, and amongst them several very difficult objects. The magnifying powers most frequently employed were 750 and 1000, with occasional use of 400 and 650. We make a short selection from M. Perrotin's results:—

Star.	Epoch.		Angle.		Distance.
			°		″
42 Comæ Berenicis ...	1883·51	...	11·5	...	0·535
44 Böotis	— ·47	...	240·6	...	4·925
γ Coronæ Borealis ...	— ·53	...	138	...	(0 17 elong.)
ξ Scorpii	— ·52	...	11 5	...	1·16
ζ Herculis	— ·52	...	99·5	...	1·49
Σ 2107	— ·49	...	231·2	...	0·57
Σ 2173	— ·53	...	35 *e*	...	0·15 *e*
τ Ophiuchi	— ·51	...	252·1	...	1·66
70 ,, ...	— ·49	...	45·6	...	2·28
λ Cygni	— ·51	...	80·3	...	0·65

With respect to Σ 2173 M. Perrotin remarks that his results confirm M. Otto Struve's opinion that the star revolves in about forty-six years. The above measures of the rapid binary ζ Herculis are closely represented by Dr. Doberck's last orbit.

THE LATE TRANSIT OF VENUS.—The last number of the *Comptes Rendus* of the Paris Academy of Sciences is almost wholly occupied by the preliminary Reports from the various expeditions sent by the French Commission for the observation of this phenomenon, and one or two expeditions acting in co-operation with the Commission. The observations of contacts, &c., appear in these Reports. The stations included are Petionville, Hayti; Puebla, Mexico; Fort Tartenson, Martinique; St. Augustin, Florida; Santa Cruz, Patagonia; Cerro-Negro near San Bernardo, Chili; Chubut, Patagonia; Rio Negro (4h. 21m. 20s. W. of Paris and 40° 47′ 51″ S.); Hoste Island, Orange Bay, Tierra del Fuego; and Bragado, Buenos Ayres. It is gratifying to note the general success which attended these expeditions, even at the most southern station in Orange Bay, the latitude of which was 55° 31′ 28″.

A CONTRIBUTION TO THE STUDY OF THE TRANSMISSION EASTWARDS ROUND THE GLOBE OF BAROMETRIC ABNORMAL MOVEMENTS [1]

II.

WHEN the fact of these simultaneous movements is recognised, the irregularities in the transmission eastwards of the abnormal movements can be in great part explained. For instance, taking the movements B″ of the Zanzibar curve, it is found to recur at B′ and B in the Belgaum and Bombay curves after an interval of six months, that is to say, about one month longer than the average, and is moreover of much greater magnitude in these curves than at Zanzibar. But it is noticeable that in the

---

[1] Concluded from p. 356.